

OXC - 1986
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25 July 1961

MEMORANDUM FOR : The Record

SUBJECT : JT11D-20 Engine Program Review

REFERENCE : (a) OXC-1823 dated 19 June 1961 titled
"JT11D-20 Engine Program Review"

(b) OXC-1479 dated 24 March 1961 titled
"JT11D-20 Engine Controls Problems"

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Part I Program Present Status

1. Pratt & Whitney, Florida, was visited during the week of 17 July 1961 for an orientation visit for subject review. During 17 and 18 July an excellent over-all briefing by Messrs. [REDACTED] The balance of the week was spent on subject review, highlights of which are summarized herewith.

2. X Engine Initial Delivery:

(a) Schedule:

Relative to the XD engine production schedule established at the 12 June Suppliers Meeting as presented in reference (a) memorandum, progress as of 24 July as assessed by the writer is as follows:

<u>Eng. No.</u>	<u>Scheduled Delivery</u>	<u>Present Assy. Status</u>	<u>Status Relative To Schedule</u>	<u>Projected Delivery Estimate</u>
XD-1	10/6/61	55% complete	2½ weeks late	10/24/61
XD-2	10/20/61	5% complete	4 weeks late	11/17/61
XD-3	11/3/61	Not Started	2 weeks late	11/17/61

At this time barring acceleration or further probable deceleration, it would appear that XD engine delivery dates will slip a minimum of 4 weeks. Although no official change in schedule is acknowledged by P&W so far, the realism of this schedule is rapidly becoming questionable.

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(b) Engine Discs:

All compressor and turbine discs for XD-1, 2, and 3 have passed the spin test for the Mach 2.0 condition (one rejected and successfully replaced) and are in or ready for engine assembly. No further delays expected here.

(c) Parts Shortages:

A combination of many engineering changes and slow recovery of a weak production control function (ref.(a) memo) has resulted in the following parts shortages of which some are purchased major components but the majority are "in house" fabricated plumbing:

<u>Eng. No.</u>	<u>Parts Short at Assembly</u>
XD-1	93
XD-2	300
XD-3	Unknown but probably much over 300

The above figures may be compared with the approximate total bill of material of 2900 parts per engine.

This area is the major force delaying the XD engine schedule. The seriousness of the situation is evidenced by the lack of feel for the shortage magnitude on XD-3!

(d) Controls:

The main and afterburner controls delivery schedule has slipped relative to that reported in reference (a) memorandum as follows:

<u>For Eng. No.</u>	<u>Delivery Schedule Was</u>	<u>Delivery Schedule Now</u>
XD-1	7/10/61	7/19/61
XD-2	7/15/61	8/3/61
XD-3	8/18/61	8/28/61

This slippage primarily is due to the necessity for recutting acceleration and droop as well as speed cams for single power lever operation at the limited Mach 2.0 condition. Hardware

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incorporation of "must conform" engineering changes resulting from the problems reported in reference (b) memorandum has also contributed to this delay.

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3. Y Engine Tentative Delivery Schedule:

Since queries to the airframe contractor have revealed no objections to the Y engine delivery schedule proposed in [] memorandum dated 14 June 1961 and as listed in reference (a) memorandum, a corresponding production schedule will be implemented.

4. Time Accumulation, Development Engine Status:

(a) In spite of a maximum level of effort, with the exception of D-20 afterburner time, very little progress is evident in the accumulation of meaningful engine test time since the 12 June meeting. The importance of this test time accumulation is paramount not only in endurance preparation for Y-PFRT but also in order to verify controls and gas generator design fixes and to verify calculated engine performance levels. It is hopefully expected (and imperative if further delay is to be minimized) that progress in this area is imminent with the return to test of engines FX-111 and FX-115 as described in paragraph (b) below.

Engine test time accumulation as follows:

<u>Time Type</u>	<u>Time As Of</u> <u>6/13/61 (hrs)</u>	<u>Time As Of</u> <u>7/21/61 (hrs)</u>	<u>Progress</u> <u>(hrs)</u>	<u>Target Prior</u> <u>Y-PFRT Dec. 1961</u>
Total Engine	2845	2916	71	3000
Full D-20	126	147	21	326
Hot Inlet	262	262	0	350
1900°F Turbine	209	209	0	300
M3.0 Mission	23	23	0	123 min.
Endurance Cycle				273 desired
D-20 Afterburner	60	97	37	250

(b) Development Engine Program Status as of 21 July:

FX-111: Starting on test A-3 sea level stand. Four weeks late due (D-20) to shortages and re-inspection. Running vibration check and verification of compressor rim damper fix.

FX-112: At assembly, 65% rebuild completed. Four weeks late now (D-20) due to component and plumbing shortages and parts re-inspection. To run plumbing, controls, and engine endurance on hot inlet sea level stand A-1. Target to test 7/31/61.

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- FX-113: At assembly, 55% rebuild completed. Program changed
(D-20) to run performance calibration on altitude stand C-5
after engine FX-115 now on C-5. Target to sea level
stand for preliminary calibration 7/31/61.
- FX-114: Some parts at assembly. Compressor and some components
(D-20) cannibalized for FX-113. Parts availability under
investigation. Targeting Y-PFRT in December 1961:
must start assembly soon to meet this target.
- FX-115: Starting on test C-5 altitude stand. Three weeks late
(D-20) due to component and plumbing shortages and parts re-
inspection. To run X-PFRT.
- FX-116: On test A-2 sea level stand. P-4 (A3J) configuration
(P-2) boundary layer control tests.
- FX-117: On test, completing D-20 afterburner calibration A-4
(P-2) sea level stand. To be moved to A-5 sea level stand
for ejector endurance targeted to start approximately
8/14/61 after plant shutdown.

Due to the timeliness of information contained herein and
necessary travel schedules, Part II of this report covering
technical and organizational problem status will be released
subsequently in order not to delay this release. Covering
summary memorandum also will be released with Part II.

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DD/P	[Redacted]	1 Aug '61				[Signature]	Aug	
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Mr. Cunningham = 6 B 4406								